

WHAT IS CLAIMED IS:

1. A semiconductor device, comprising:

square first semiconductor chip and square second semiconductor chip laminated with their respective one main surfaces opposite to each other;

a supporting lead a part of which is arranged between one main surface of the first semiconductor chip and one main surface of the second semiconductor chip; and

a resin sealing body that seals the first semiconductor chip, the second semiconductor chip and the supporting lead, wherein:

the respective one main surfaces of the first semiconductor chip and the second semiconductor chip are bonded to a part of the supporting lead via an adhesive layer; and

a part of the supporting lead is formed so that it has smaller width than the respective sides of the first semiconductor chip and the second semiconductor chip.

2. A semiconductor device, comprising:

square first semiconductor chip and square second semiconductor chip laminated with their respective one main surfaces opposite to each other;

plural supporting leads a part of each of which is arranged between one main surface of the first semiconductor chip and one main surface of the second semiconductor chip; and

a resin sealing body that seals the first semiconductor

chip, the second semiconductor chip and the plural supporting leads, wherein:

the respective one main surfaces of the first semiconductor chip and the second semiconductor chip are bonded to a part of each of the plural supporting leads via an adhesive layer; and

a part of each of the plural supporting leads is formed so that it has smaller width than a value acquired by dividing the length of the shortest side of the respective sides of the first semiconductor chip and the second semiconductor chip by the number of the supporting leads.

3. A semiconductor device, comprising:

square first semiconductor chip and square second semiconductor chip laminated with their respective one main surfaces opposite to each other;

a frame arranged between one main surface of the first semiconductor chip and one main surface of the second semiconductor chip;

plural supporting leads a part of each of which is arranged between the first semiconductor chip and the second semiconductor chip and is integrated with the frame; and

a resin sealing body that seals the first semiconductor chip, the second semiconductor chip, the frame and the plural supporting leads, wherein:

the respective one main surfaces of the first semiconductor chip and the second semiconductor chip are bonded to the frame

via an adhesive layer;

the frame is formed in the outline size smaller than the respective outline sizes of the first semiconductor chip and the second semiconductor chip; and

a part of each of the plural leads is formed so that it has smaller width than a value acquired by dividing the length of the shortest side of the respective sides of the first semiconductor chip and the second semiconductor chip by the number of the supporting leads.

4. A semiconductor device according to Claim 1, wherein:
the first semiconductor chip and the second semiconductor chip are formed in the same outline size.

5. A semiconductor device according to Claim 1, wherein:
the first semiconductor chip and the second semiconductor chip are formed in different outline sizes.

6. A semiconductor device according to Claim 1, wherein:
a part of the supporting lead has a first part bonded to one main surface of the first semiconductor chip via an adhesive layer and a second part bonded to one main surface of the second semiconductor chip via an adhesive layer; and

the respective first and the second parts are different from each other in a direction of the thickness of the semiconductor chip.

7. A semiconductor device according to Claim 2, wherein:
a part of each of the plural supporting leads has a first

part bonded to one surface of the first semiconductor chip via an adhesive layer and a second part bonded to one main surface of the second semiconductor chip via an adhesive layer; and

the respective first part and the second parts are different from each other in a direction of the thickness of the semiconductor chip.

8. A semiconductor device according to Claim 3, wherein:

the frame has a first part bonded to one main surface of the first semiconductor chip via an adhesive layer and a second part bonded to one main surface of the second semiconductor chip via an adhesive layer; and

the respective first and the second parts are different from each other in a direction of the thickness of the semiconductor chip.

9. A semiconductor device according to Claim 3, wherein:

the frame has a groove pierced from the inside to the outside of a part of the frame.

10. A semiconductor device according to Claim 4, wherein:

the first semiconductor chip is provided with plural electrodes on the other main surface opposite to the one main surface; and

the second semiconductor chip is provided with plural electrodes on the other main surface opposite to the one main surface.

11. A semiconductor device according to Claim 4, wherein:

the first semiconductor chip is provided with plural electrodes arranged along a first side on the side of the first side of opposite first side and second side of the one main surface;

the second semiconductor chip is provided with plural electrodes arranged along a first side on the side of the first side of opposite first side and second side of the one main surface; and

the first semiconductor chip and the second semiconductor chip are bonded in a state that the respective one main surfaces are opposed so that the second side of the second semiconductor chip is located on the side of the first side of the first semiconductor chip, the electrode of the second semiconductor chip is located outside the second side of the first semiconductor chip and the electrode of the first semiconductor chip is located outside the second side of the second semiconductor chip.

12. A semiconductor device according to Claim 5, wherein:

the first semiconductor chip is provided with plural electrodes on the other main surface opposite to the one main surface; and

the second semiconductor chip is provided with plural electrodes on the other main surface opposite to the one main surface.

13. A semiconductor device according to Claim 5, wherein:

the first semiconductor chip is provided with plural

electrodes on the other main surface opposite to the one main surface and is formed in smaller outline size than that of the second semiconductor chip; and

the second semiconductor chip is provided with plural electrodes on the one main surface.

14. A method of manufacturing a semiconductor device, comprising the steps of:

(a) preparing square first semiconductor chip and square second semiconductor chip laminated with their respective one main surfaces opposite to each other and further preparing a lead frame provided with a supporting lead a part of which is arranged between one main surface of the first semiconductor chip and one main surface of the second semiconductor chip and formed so that the part has smaller width than the respective sides of the first semiconductor chip and the second semiconductor chip;

(b) bonding one main surface of the first semiconductor chip and a part of the supporting lead via an adhesive layer and bonding one main surface of the second semiconductor chip and the part of the supporting lead via an adhesive layer; and

(c) forming a resin sealing body by sealing the first semiconductor chip, the second semiconductor chip and the supporting lead with resin.

15. A semiconductor device, comprising:

a first semiconductor chip which is provided with first main surface and second main surface which are opposite to each

other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first side and second side of the first main surface;

a second semiconductor chip which is provided with first main surface and second main surface which are opposite to each other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first side and second side of the first main surface;

plural first leads each of which has an inner part and an outer part, the inner part of each of which is arranged outside the first side of the first semiconductor chip and the inner part of each of which is electrically connected to an electrode of the first semiconductor chip via conductive wire;

plural second leads each of which has an inner part and an outer part, the inner part of each of which is arranged outside the first side of the second semiconductor chip and the inner part of each of which is electrically connected to an electrode of the second semiconductor chip via conductive wire; and

a resin sealing body that seals the first semiconductor chip, the second semiconductor chip, the respective inner parts of the plural first leads, the respective inner parts of the plural second leads and the conductive wire, wherein:

the first semiconductor chip and the second semiconductor

chip are bonded in a state that the respective first main surfaces are opposed so that the first side of the first semiconductor chip and the second side of the second semiconductor chip are located on the side of the first lead, the electrode of the first semiconductor chip is located outside the second side of the second semiconductor chip and the electrode of the second semiconductor chip is located outside the second side of the first semiconductor chip.

16. A semiconductor device according to Claim 15, wherein:

the surface connected with wire of each inner part of the plural first leads is located on the side of the first semiconductor chip instead of the second main surface of the second semiconductor chip; and

the surface connected with wire of each inner part of the plural second leads is located on the side of the second semiconductor chip instead of the second main surface of the first semiconductor chip.

17. A semiconductor device according to Claim 15, further comprising:

a supporting lead a part of which is bonded to the second main surface of the first semiconductor chip or the second main surface of the second semiconductor chip via an adhesive layer.

18. A semiconductor device according to Claim 15, further comprising:

a supporting lead a part of which is arranged between the first main surface of the first semiconductor chip and the first main surface of the second semiconductor chip, wherein:

the first semiconductor chip and the second semiconductor chip are bonded to a part of the supporting lead.

19. A semiconductor device according to Claim 17, wherein:

the second main surface of the semiconductor chip to which a part of the supporting lead is not bonded out of the first semiconductor chip and the second semiconductor chip is exposed from the resin sealing body.

20. A semiconductor device according to Claim 18, wherein:

the respective second main surfaces of the first semiconductor chip and the second semiconductor chip are exposed from the resin sealing body.

21. A method of manufacturing a semiconductor device, comprising the steps of:

(a) preparing a first semiconductor chip which is provided with first main surface and second main surface which are opposite to each other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first and second sides of the first main surface and a second semiconductor chip which is provided with first main surface and second main surface

which are opposite to each other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first and second sides of the first main surface and further preparing a lead frame provided with first lead group and second lead group which are opposite to each other and a supporting lead arranged between the first lead group and the second lead group;

(b) bonding the second main surface of the first semiconductor chip and the supporting lead in a state that the first semiconductor chip is arranged so that the first side of the first semiconductor chip is located on the side of the first lead group;

(c) bonding the first semiconductor chip and the second semiconductor chip in a state that the first main surface of the first semiconductor chip and the first main surface of the second semiconductor chip are opposed so that the first side of the second semiconductor chip is located on the side of the second lead group, the electrode of the second semiconductor chip is located outside the second side of the first semiconductor chip and the electrode of the first semiconductor chip is located outside the second side of the second semiconductor chip;

(d) electrically connecting the electrode of the first semiconductor chip with each inner part of leads of the first lead group via conductive wire and electrically connecting the electrode of the second semiconductor chip with each inner part

of leads of the second lead group via conductive wire; and

(e) forming a resin sealing body by sealing the first semiconductor chip, the second semiconductor chip, the inner parts of the leads of the first lead group, the inner parts of the leads of the second lead group and the conductive wire with resin.

22. A method of manufacturing a semiconductor device, comprising the steps of:

(a) preparing a first semiconductor chip which is provided with first main surface and second main surface which are opposite to each other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first and second sides of the first main surface and a second semiconductor chip which is provided with first main surface and second main surface which are opposite to each other, the plane of which is formed in a square and which is provided with plural electrodes arranged along a first side on the side of the first side of the opposite first and second sides of the first main surface and further preparing a lead frame provided with first lead group and second lead group which are opposite to each other and a supporting lead arranged between the first lead group and the second lead group;

(b) bonding the first main surface of the first semiconductor chip and the supporting lead in a state that the first semiconductor chip is arranged so that the first side of

the first semiconductor chip is located on the side of the first lead group;

(c) bonding the second semiconductor chip and the supporting lead in a state that the first main surface of the first semiconductor chip and the first main surface of the second semiconductor chip are opposed so that the first side of the second semiconductor chip is located on the side of the second lead group, the electrode of the second semiconductor chip is located outside the second side of the first semiconductor chip and the electrode of the first semiconductor chip is located outside the second side of the second semiconductor chip;

(d) electrically connecting the electrode of the first semiconductor chip with each inner part of leads of the first lead group via conductive wire and electrically connecting the electrode of the second semiconductor chip with each inner part of leads of the second lead group via conductive wire; and

(e) forming a resin sealing body by sealing the first semiconductor chip, the second semiconductor chip, the inner parts of the leads of the first lead group, the inner parts of the leads of the second lead group and the conductive wire with resin.